VOL'KENSHTEYN, M.V.; LEVITAN, I.O.

Optical activity and conformation of some alicyclic terpenes. Zhur. strukt.khim. 3 no.1:87-92 Ja-F '62. (MIRA 15:3)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR i Leningradskiy gosudarstvennyy pedagogicheskiy institut imeni A.I.Gertsena.

(Terpenes—Optical properties)

S/192/62/003/003/001/006
D228/D307

AUTHORS: Yü Pao-shan, Nikitin, V.N, and Vol'kenshteyn, M. V.

TITLE: Spectroscopic study of substituted acryl- and methacryl amides and their reaction capacity on polymerization

PERIODICAL: Zhurnal strukturnoy khimii, v. 3, no. 3, 1962, 287-291

TEXT: Spectroscopic methods -- combination scattering and absorption in the IR- and UV-regions -- were used to study the multiple bond conjugation and the intermolecular hydrogen bonds in methylacrylamide (I), methylmethacrylamide (II), dimethylmethacrylamide (III), and diethylmethacrylamide (IV). The presence of intermolecular hydrogen bonds was established in I and II, and it was shown that the hydrogen bonds substantially influence the degree of conjugation. The reaction capacity of these compounds in the process of initiated thermal polymerization, which was determined by G. M. Chetyrkina, conforms to the degree of conjugation ascertained from the spectral combination-scattering intensity and from

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S/192/62/003/003/001/006
D228/D307

Spectroscopic study of ...

the refraction exaltation. The degree of conjugation -- I > II > III, IV -- grows as the reaction capacity increases. There are 3 figures and 1 table.

ASSOCIATION: Institut vysokomolekulyarnykh soyedineniy AN SSSR, Leningrad (Institute of Highmolecular Compounds, AS USSR, Leningrad)

SUBMITTED: May 19, 1961

Card 2/2

BIRSHTEYN, T.M.; VOL'KENSHTEYN, M.V.; GOTLIB, Yu.Ya.; PTITSYN, O.B.

Approximate method for the calculation of the optical anisotropies of macromolecules. Vysokom.soed. 4 no.5:670-677 My '62. (MIRA 15:7)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR.
(Macromolecular compounds—Optical properties)

3R293
S/190/62/004/006/021/026
B101/B110

15.8050

AUTHORS: Sharonov, Yu. A., Vol'kenshteyn, M. V.

TITLE: Co-operative effects in the annealing and softening of polyvinyl acetate

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 6, 1962, 917-921

TEXT: In continuation of an earlier paper (Vysokomolek. soyed., 3, 1739, 1962) concerning the effect of annealing on the softening of noncrystallizing glassy polymers, the same method was used to determine the relaxation time τ and, at 21 and 29.5°C, the specific heat, C_p, of amorphous polyvinyl acetate (PVA). The equation $1/\tau = d \ln(H - H_e)/dt$ was experimentally checked; H = enthalpy, H_e = enthalpy of the equilibrium state. The following was found: $\tau = \tau_e \exp[-a(H - H_e)]$, where τ_e is the value of τ at $H = H_e$, $a = 7.83$ cal·g^{-1}; and $\tau_e = \tau_o \exp[-bT(°C)]$, where $\tau_o = 2.0 \cdot 10^{21}$ hr, $b = 1.32$ deg^{-1}. In the range $T < T_s$ (T_s = softening

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temperature), τ depends not only on H but also on H_e. The dependence of the function $C_p(T)$ on $H - H_e$ with different times of annealing showed that $C_{p\ max} = \infty$ after 40 days of annealing. Integration of $C_p(T)$ (Fig. 5) showed that a discontinuity of enthalpy occurred at the softening temperature ($40^\circ C$). The amorphous polymer imitates a phase transition of the first order. In addition, an irregularity in the range of $C_{p\ max}$ was observed when heating PVA annealed for 40 days, which showed a slight temperature drop (from ~ 44.9 to $\sim 44.7^\circ C$) during ~ 100 sec at a heating rate of 0.23 cal/g·min. These results are interpreted as proof of the co-operative mobility of the macromolecules, which is particularly noticeable near T_s. There are 6 figures and 1 table. The most important English-language references are: A. J. Kovacs, J. Polymer Sci., 30, 131, 1958; H. Temperley, Changes of State, London, 1956.

ASSOCIATION: Institut vysokomolekulyarnykh soyedineniy AN SSSR (Institute of High-molecular Compounds AS USSR)

SUBMITTED: April 17, 1961

S/190/62/004/006/025/026
B110/B138

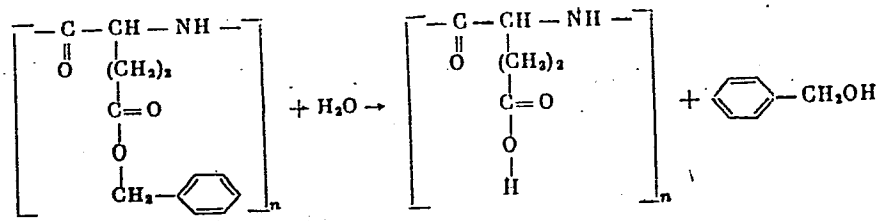
AUTHORS: Volkenshteyn, M. V., Kol'tsov, A. I., Marshal', Zh.

TITLE: Investigation of polymers by means of nuclear magnetic resonance. III. Chemical reactions in solutions of poly-γ-benzyl-L-glutamate in trifluoracetic acid

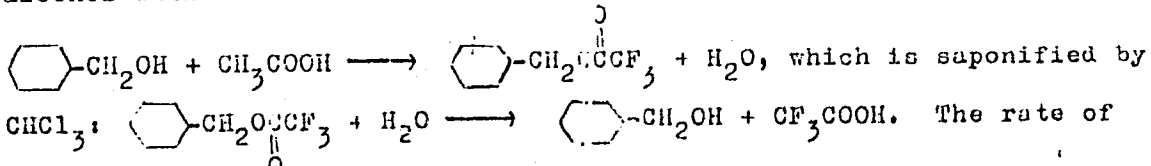
PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 6, 1962, 944-947

TEXT: The behavior of poly-γ-benzyl-L-glutamate (I) in solutions was investigated with regard to the transition from spirals to lumps. The nuclear magnetic resonance spectra of I (molecular weight 150,000) were obtained in mixtures of benzene and trifluoro acetic acid (II) with a JNM-3 spectrometer at 40 kcps. The spectra remained unchanged with an 80% volume increase of II. With further increase a new line appears $\delta = 60$, while that of the methylene group of I bonded to the phenyl decreases at $\delta = 62$. The same occurs for solutions of I in pure II. Hydrolysis of I is assumed, the molecules losing the rigid spiral shape:

Investigation of polymers by means ...



The poly-L-glutamic acid formed thereby remains in solution, the benzyl alcohol with II forms an emulsified ester:



which is saponified by $CHCl_3$: The rate of hydrolysis of I is much lower than that of the esterification of benzyl alcohol.

Card 2/2 Inst. High Molecular Compounds, AS USSR

VOL'KENSHTEYN, M.V.; GODZHAYEV, N.M.; GOTLIB, Yu.Ya.

Uncoiling the double spiral in deoxyribonucleic acid (DNA). Biofizika 7 no.1:16-20 '62. (MIRA 15:5)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR, Leningrad.
(NUCLEIC ACIDS)

5,4600

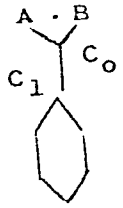
S/051/62/012/003/004/016
E202/E192

AUTHORS: Milevskaya, I.S., and Vol'kenshteyn, M.V.

TITLE: E.p.r. spectra of polystyrene radicals

PERIODICAL: Optika i spektroskopiya, v.12, no.3, 1962, 381-386

TEXT: Detailed quantum mechanics calculations of the spin density distribution of radicals formed during mechanical destruction and irradiation of polystyrene are given. Three types of radicals are discussed, as shown below. Types I and II were further subdivided and studied according to whether the A and B atoms are coplanar with the phenyl ring while the π-electrons of the ring and the unpaired electron form a single system, or whether the plane of the ring is turned by 90° about the C_oC_1 axis, viz:



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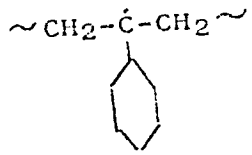
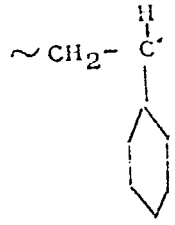
S/051/62/012/003/004/016
E202/E192

E.p.r. spectra of polystyrene ....

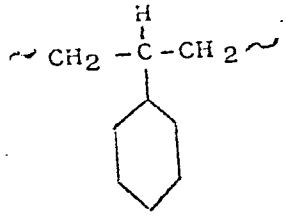
Type I



II



III



Card 2/3

E.p.r. spectra of polystyrene ...

Experimental evidence was given suggesting also the presence of type III, to which a special attention was given. In the calculation of its spin density only σ-electrons of the phenyl ring were considered, taking altogether seven valency structures. The spin density (calculated from the wave function) gave at the hydrogen atoms closest to the unpaired electron $\varrho_H = - 0.096$, which corresponded to the splitting on these protons of $Q = 49$ gauss, as previously given by the present authors (Ref.1: Opt. i spektr. v.11, 349, 1961) and was also in good agreement with the experimental data. It was concluded that the discrepancies in the experimental results quoted by various authors could be attributed to their observing different types of radicals. Finally, using the hyperfine structure and splitting data of their previous paper (Ref.1) the authors evaluated the conformation of one of the radicals.

SUBMITTED: March 22, 1961

Card 3/3

VOLKENSTEIN,N.V.,(Vol'kenshteyn, M.V.)

Cooperative processes in biology. Analele biol 16 no.1:24-32 Ja-F '62

S/076/62/036/004/002/012
B101/B110

15.8400

AUTHORS: Yü Pao-shan ', Nikitin, V. N., and Vol'kenshteyn, M. V. (Leningrad)

TITLE: Spectra and thermal polymerization reactivity of styrene derivatives

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 4, 1962, 681-689

TEXT: The effect of the conjugation of the double bond in styrene and its derivatives on the activation energy of the initiation of radical polymerization was studied. The infrared spectra of pure compounds as well as the Raman spectra of compounds dissolved in CCl_4 (1 molecule monomer per 5 molecules CCl_4) were recorded. In determining the differential intensity of the Raman lines, the intensity of the 459 cm^{-1} line of CCl_4 was taken as being 100. The following data are given for the intensity of the line characterizing the C=C bond:

Spectra and thermal polymerization ...

Compound	Raman spectrum F	D	I	Infrared spectrum Intensity
Styrene	1631	130	89	30
p-methyl styrene	1631	150	162	33
o-methyl styrene	1625	94	73	43
α-methyl styrene	1633	75	57	27
p-chloro styrene	1634	178	141	36
o-chloro styrene	1631	88	65	45
2-chloro-3,5-dimethyl styrene	1629	97	61	60
2,3-dichloro-4,5-dimethyl styrene	1631	93	74	65
penta chloro styrene	1635	-	-	-

Legend: F = frequency, cm^{-1}; D = differential intensity; I = integral intensity. From these data there follows a strong dependence of the intensity of the C=C bond Raman line on the degree of conjugation with the benzene ring and its substituents. The intensity of the infrared spectrum shows the same dependence, but is less sensitive. A dependence of the

activation energy (AE, kcal/mole) on the intensity D of the Raman lines was also found: α-methyl styrene (does not polymerize), D = 75; styrene AE = 22.0, D = 130; p-methyl styrene AE = 16.0, D = 150; p-chloro styrene AE = 14.6, D = 178. Thus, the effective AE characterizes the reactivity of the monomer. There are 3 figures and 5 tables.

ASSOCIATION: Institut vysokomolekulyarnykh soyedineniy Akademii nauk SSSR (Institute of High-molecular Compounds of the Academy of Sciences USSR)

SUBMITTED: May 30, 1960

VOL'KENSHTEYN, M.V.

Muscular activity. Dokl. AN SSSR 146 no.6:1426-1429 O '62.
(MIRA 15:10)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR.
Predstavleno akademikom A.V. Engel'gardtom.
(MUSCLES)

S/181/63/005/002/034/051
B102/B186

AUTHORS: Sharonov, Yu. A., and Vol'kenshteyn, M. V.

TITLE: Enthalpy relaxation in cooperative effects on polystyrene in the vitrification region

PERIODICAL: Fizika tverdogo tela, v. 5, no. 2, 1963, 590 - 598

TEXT: The authors use the same calorimetric method as they have used previously (Vysokomolek. soyedin. 4, 917, 1962) for studying the change in n on annealing polyvinyl acetate (PVA) at $T > T_v$. They now determine the temperature dependences of the specific heat c and the enthalpy H for polystyrene (PS) and calculate the relaxation time τ from the relation $1/\tau = -d \ln (H-H_e)/dt$. $H-H_e$ denotes the difference between nonequilibrium and equilibrium enthalpies. The approach of H to H_e was investigated from the positive ($H > H_e$, $T < T_v$) as well from the negative side ($H < H_e$, $T > T_v$); $T_v = 99^{\circ}C$ is the vitrification temperature. The results obtained for PS are compared with those for PVA. The following was found: As in the case

of PVA, τ of PS, determined from the approaching rate of H to H_e (at $T < T_v$), increases exponentially with decreasing $H-H_e$. $\ln \tau = \ln \tau_e + b(T-T_e)$; $b = (1.2 \pm 0.2)\ deg^{-1}$; $(b = d\ln\tau/dT)$. $\left(\frac{\partial \ln \tau}{\partial T}\right)_{T-T_e} = const = -0.64\ deg^{-1}$. $\left(\frac{\partial \ln \tau}{\partial H}\right)_{H_e-H} = -1.28 g/cal$; for PVA this value was -2.80 g/cal. Also at $T > T_v$, τ is an exponential function of $H-H_e$ but then it decreases on approaching H_e. The pretreatment of the samples seems to be without effect on $f(H-H_e)$ but it does seem to affect the relation parameters. On heating with constant rate ($\sim$0.5 deg/min) c(T) has a maximum whose height and position depends on the heating rate and the annealing period at $T < T_v$. Annealing was carried out at 89.5°C. There are 5 figures and 3 tables.

ASSOCIATION: Institut vysokomolekulyarnykh soyedineniy AN SSSR, Leningrad
(Institute of High-molecular Compounds AS USSR, Leningrad)

SUBMITTED: September 18, 1962

S/190/63/005/003/019/024
B101/B203

AUTHORS: Abdrashitov, R. A., Bazhenov, N. M., Vol'kenshteyn, M. V., Kol'tsov, A. I., Khachaturov, A. S.

TITLE: Study of polymers by nuclear magnetic resonance. III. Mobility of polyhalogen styrene macromolecules

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 5, no. 3, 1963, 405-411

TEXT: The temperature dependence of the width and of the second moments of the nmr absorption bands of fluorine and hydrogen nuclei was studied in poly-2-fluoro-5-methyl styrene at 20-125°C. The curves $\Delta H_F(T)$ and $\Delta\overline{H_F^2}(T)$ showed distinct transitions at 85 and 115°C, the curves $\Delta H_H(T)$ and $\Delta\overline{H_F^2}(T)$ showed only one indistinct transition at 110°C. The experimental values at 20-80°C are: $\Delta H_F = 5.8\pm0.3$ gauss; $\Delta\overline{H_F^2} = 5.0\pm0.3$ gauss^2; $\Delta H_H = 8.2\pm0.3$ gauss; $\Delta\overline{H_H^2} = 15.2\pm0.6$ gauss^2; and at 90-110°C, $\Delta H_F = 5.3\pm0.3$ gauss; $\Delta\overline{H_F^2}$

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$= 3.6 \pm 0.3$ gauss^2. A comparison of the experimental values for $\overline{\Delta H_F^2}$ with the values calculated according to J. H. Van Vleck (Phys. Rev., 74, 1168, 1948) suggests a flat syndiotactic chain as the most probable configuration of the polymer. The transition point at 85°C is caused by torsional oscillations. The observed decrease of $\overline{\Delta H_F^2}$ can be explained by cooperative synphase torsional oscillations; this is also most probable for steric reasons. The transition point at 115°C is caused by softening. The decrease of $\overline{\Delta H_H^2}$ with increasing temperature is due to another form of intramolecular motion which does not affect $\overline{\Delta H_F^2}$. There are 4 figures and 1 table.

ASSOCIATION: Institut vysokomolekulyarnykh soyedineniy AN SSSR (Institute of High-molecular Compounds AS USSR)

SUBMITTED: September 20, 1961

VOL'KENSHTEYN, M.V.

Genetic coding of the protein structure. Genetika no.2:54-62 Ag '65. (MIRA 18:10)

1. Institute of High Molecular Compounds, Academy of Sciences of the U.S.S.R., Leningrad.

VOL'KENSHTEYN, M.V.

Coding polar and nonpolar amino acid residues in proteins. Biofizika 10 no.6:1083-1084 '65. (MIRA 19:1)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR, Leningrad. Submitted March 9, 1965.

KHACHATUROV, A.S.; BAZHENOV, N.M. [deceased]; VOL'KENSHTEYN, M.V.; DOLGOPOL'SKIY, I.M.; KOL'TSOV, A.I.

Using the method of nuclear magnetic resonance in the study of fluorine-containing rubber. Kauch. i rez. 24 no.12:6-10 '65. (MIRA 18:12)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR, Leningrad.

VAZINA, A.A.; BOLOTINA, I.A.; VOL'KENSHTEYN, M.V.; LYASOTSKAYA, I.; FRANK, G.M.

Configuration of a polypeptide chain in G- and F-actin. Biofizika 10 no.4:567-570 '65. (MIRA 18:8)

1. Institut biologicheskoy fiziki AN SSSR, Moskva, i Institut vysokomolekulyarnykh soyedineniy AN SSSR, Leningrad.

VOL'KENSHTEYN, M.V.; SHEMELIN, A.K.

Anomalous dispersion of optic activity of dolphin myoglobin and horse hemoglobin. Biokhimiia 30 no.1:148-152 Ja-F '65. (MIRA 18:6)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR i fizicheskiy fakul'tet Gosudarstvennogo universiteta, Leningrad.

VOL'KENSHTEYN, M.V.; KOL'TSOV, A.I.; KHACHATUROV, A.S.

Molecular motion in poly-2,5-difluorostyrene as determined by nuclear magnetic resonance. Vysokom. soed. 7 no.2:296-298 F '65. (MIRA 18:3)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR.

BAKLAGINA, Yu.G.; VOL'KENSHTEYN, M.V.; KONDRASHOV, Yu.D.

X-ray study of 1-methyl-5-bromouracil and 9-methyladenine complex. Biofizika 10 no.1:165-166 '65. (MIRA 18:5)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR, Leningrad.

VOL'FENSHTEYN, M.V.

Theory of the [illegible] polymers. Dokl. AN [illegible] (MIRA 18:1)
160 no.2:462-[illegible] Ja '65.

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR. Submitted April 22, 1964.

VOL'KENSHTEYN, M.V.; FISHMAN, S.N.

Protein synthesis on polysomes. Dokl. AN SSSR 160 no.6:1407-1410 F '65. (MIRA 18:2)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR. Submitted May 26, 1964.

VOL'KENSHTEYN, M.V.

Findings on the genetic code. Biofizika 8 no.3:394-395 '63. (MIRA 17:11)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR, Leningrad.

L 35434-65 EWT(m)/EWP(j)/T Pc-4 RM

ACCESSION NR: AP5005593 S/0190/65/007/002/0250/0254

AUTHORS: Kol'tsov, A. I.; Vol'kenshteyn, M. V.

TITLE: Determining the degree of orientation of macromolecules in polymer fibers by means of nuclear magnetic resonance

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 7, no. 2, 1965, 250-254

TOPIC TAGS: macromolecule, nuclear magnetic resonance, polymer, fiber

ABSTRACT: The authors suggest a means of using nuclear magnetic resonance to determine the degree of orientation of macromolecules of polymer fibers. This method is based on the measurements of anisotropy in the nuclear magnetic resonance spectra of oriented polymers, and is applicable when the distribution function of the polymer chains is unknown. Preliminary calculations have been made for determining the degree of orientation of polyvinyl alcohol, polyacrylonitrile, and polyvinyl chloride. It is shown that this anisotropy varies substantially for helical and plane polymer chains. The authors point out that it is possible to determine the dominant conformation of polymer chains by comparing experimental and theoretical dependence of line anomaly (mean square width) in nuclear magnetic

Card 1/2

L 35484-65
ACCESSION NR: AP5005593

resonance on the angle between the magnetic field and the axis of the fiber. The theoretical value of the mean square width of the resonance lines computed by Van Vleck's formula for isotropic material is similar to the experimental value obtained at room temperature for isotropic samples of polyvinyl alcohol fibers. This indicates that no noticeable molecular movement is present in the polyvinyl alcohol, and, by virtue of this, it indicates also that the method employed here is practicable. Orig. art. has: 3 figures and 11 formulas.

ASSOCIATION: Institut vysokomolekulyarnykh soyedineniy, AN SSSR (Institute of High-Molecular Compounds, AN SSSR)

SUBMITTED: 10Apr64 ENCL: 00 SUB CODE: OC,NP

NO REF SOV: 004 OTHER: 010

Card 2/2

VOL'KENSHTEYN, M.V., doktor fiz.-matem. nauk, prof., red.; SHEYNKER, Yu.N., doktor khim. nauk, red.; SAMITOV, Yu.Yu., kand. fiz.-mat. nauk, red.; AFANAS'YEV, V.A., kand. khim. nauk, red

[Transactions of the Conference on the Physical Methods of Study of Organic Compounds and Chemical Processes] Trudy Soveshchaniia po fizicheskim metodam issledovaniia organicheskikh soedinenii i khimicheskikh protsessov. Frunze, Ilim, 1964. 268 p. (MIRA 17:11)

1. Soveshchaniye po fizicheskim metodam issledovaniya organicheskikh soyedineniy i khimicheskikh protsessov. Frunze, 1962. 2. Institut vysokomolekulyarnykh soyedineniy AN SSSR, Leningrad (for Vol'kenshteyn). 3. Institut khimii prirodnykh soyedineniy AN SSSR, Moskva (for Sheynker). 4. Kazanskiy gosudarstvennyy universitet, Kazan' (for Samitov). 5. Institut organicheskoy khimii AN Kirgizskoy SSR, Frunze (for Afanas'yev).

SHARONOV, Yu.A.; VOL'KENSHTEYN, M.V.

Calorimetric study of the softening and annealing of amorphous polymers. Fiz. tver. tela 6 no.5:1270-1280 My '64.
(MIRA 17:9)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR, Leningrad.

NIKIFOROVA, Ye.V.; [illegible] M.V.; SHAVLOVSKIY, T.V.

Studying the interaction of DNA with acridine dyes by the method of luminescence. Biofizika 7 no.5: 560-562 '62. (MIRA 17:8)

1. Institut vysokomolekulyarnykh soyedineniy, Leningrad.

VOL'KENSHTEYN, M.V.; GODZHAYEV, N.M.; GOTLIB, Yu.A.; PTITSYN, O.B.

Kinetics of biosynthesis. Biofizika 8 no.1:3-8 '63.
(MIRA 17:8)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR, Leningrad.

ACCESSION NR: AP4034902 S/0181/64/006/005/1270/1280

AUTHORS: Sharonov, Yu. A.; Vol'kenshteyn, M. V.

TITLE: Calorimetric investigation of softening and annealing amorphous polymers

SOURCE: Fizika tverdogo tela, v. 6, no. 5, 1964, 1270-1280

TOPIC TAGS: calorimetry, polymer, annealing, vitrification, enthalpy, polyvinyl acetate

ABSTRACT: This is a continuation of the authors' previous work on calorimetric studies of softening and annealing amorphous polymers (Vy*sokomol. soyed., 3, 1739, 1961; 4, 917, 1962; FTT, 5, 590, 1963). They studied the kinetics of enthalpy relaxation of polyvinyl acetate, within the softening interval, to equilibrium values under adiabatic annealing. As with polystyrene, the relaxation time at a constant temperature below the vitrification point decreases exponentially with decrease in degree of deviation of the system from equilibrium, and this is characterized by the enthalpy difference. At any particular temperature and enthalpy difference, the relaxation time depends on the thermal history of the sample. This history may be computed by introducing a parameter of absolute relaxation time

Card 1/2

ACCESSION NR: AP4034902

(depending on the annealing time at temperatures below the vitrification point and leading to a single temperature value). The heat capacity in the softening interval, as computed by means of a function relating absolute relaxation time, temperature, and enthalpy difference, agrees with experimental values. "We thank Ye. V. Kuvshinskiy for his valuable remarks." Orig. art. has: 6 figures, 1 table, and 14 formulas.

ASSOCIATION: Institut vy*sokomolekulyarny*kh soyedineniy, AN SSSR Leningrad (Institute of High-Molecular Compounds AN SSSR)

SUBMITTED: 020ct63 ENCL: 00

SUB CODE: SS, MT NO REF SOV: 010 OTHER: 033

Card 2/2

SHEYNKER, Yu.N.; PERESLENI, Ye.M.; KOL'TSOV, A.I.; BAZHENOV, N.M.
VOL'KENSHTEYN, M.V.

Structure of 2-aminothiazoline. Dokl.AN SSSR 148 no.4:878-880 F '63. (MIRA 16:4)

1. Institut khimii prirodnykh soyedineniy AN SSSR, Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy institut i Institut vysokomolekulyarnykh soyedineniy AN SSSR. Predstavleno akademikom M.M.Shemyakinym.
(Thiazoline)

VOL'KENSHTEYN, M.V.; SUSHCHINSKIY, M.M.

Seventh European Congress on Molecular Spectroscopy at Budapest. Opt. i spektr. 15 no.6:841-842 D '63.
(MIRA 17:1)

VOLKENSHTEYN, M. V.; SHARONOV, Yu. A.

"Calorimetric investigation ofsoftening and annealing of polymeric glasses."

report submitted for 4th All-Union Conf on Structure of Glass, Leningrad, 16-21 Mar 64.

VOLKENSHTEYN, M. V.

Issledovaniye struktury i mekhanizma rastyazheniya polimerov metodom infrakrasnoy spektroskopii.

report submitted for the VIIth European Congress on Molecular Spectroscopy, Budapest, 22-27 Jul 1963.

VOL'KENSHTEYN, Mikhail Vladimirovich; LESHKOVTSEV, V.A., red.

[Molecules and life; introduction to molecular biophysics] Molekuly i zhizn'; vvedenie v molekuliarnuiu biofiziku. Moskva, Nauka, 1965. 504 p. (MIRA 18:11)

L 11778-66 EWT(1)/EWT(m)/EWP(j)/EWA(c) IJP(c)/RPL WW/GG/RM

ACC NR: AP6001091 SOURCE CODE: UR/0138/65/000/012/0006/0010

AUTHOR: Khachaturov, A. S.; Vol'kenshteyn, M. V.; Dolgopol'skiy, I. M.; Kol'tsov, A. I.; Bazhenov, N.M. (Deceased)

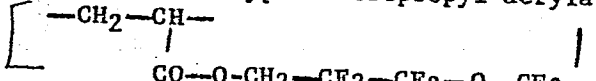
ORG: Institute of High Molecular Compounds, AN SSSR, Leningrad (Institut vysokomolekulyarnykh soyedineniy AN SSSR)

TITLE: Nuclear magnetic resonance study of fluorinated rubbers

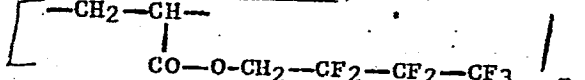
SOURCE: Kauchuk i rezina, no. 12, 1965, 6-10

TOPIC TAGS: nuclear magnetic resonance, synthetic rubber, spectrum analysis, elastomer, fluorinated organic compound

ABSTRACT: Two samples of fluorinated rubberlike elastomers were studied by means of NMR: polyperfluoromethoxyperfluoropropyl acrylate (PFMPA)



and polyperfluorobutyl acrylate (PFBA)



The temperature of the experiments ranged from 20C to the liquid nitrogen temperature. To analyze the temperature dependence of the width of partially superimposed absorption lines, a method was proposed and used in which the width of the spectral

Card 1/2 UDC: 678.743.31-134.341:541.6

ACC NR: AP6001091

lines was determined from the contour of their outer shoulders. In PFMPA, the fluorine-containing groups separated by an oxygen atom have a much greater mobility than the corresponding groups in PFBA at the same temperatures. Experimental values of the second moments were determined for fluorine and hydrogen nuclei in the temperature range from -50 to -200C for both rubbers. Theoretical values of the second moments were calculated for rubbers in the hard, nonelastic state. It was shown by comparison that only the terminal CF_3-O- group retains its capacity to move at -180C. Orig. art. has: 4 figures.

SUB CODE: 11, 20 / SUBM DATE: none / ORIG REF: 005 / OTH REF: 012

NW

VOL'KENSHTEYN, M.V.; FISHMAN, S.N.

Theory of matrix synthesis of polynucleotides. Biofizika 10 no.5:723-728 '65. (MIRA 18:10)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR, Leningrad.

VOLKENSHTEYN, M.V.

Category : USSR/Atomic and Molecular Physics - Physics of High-Molecular Substances. D-9

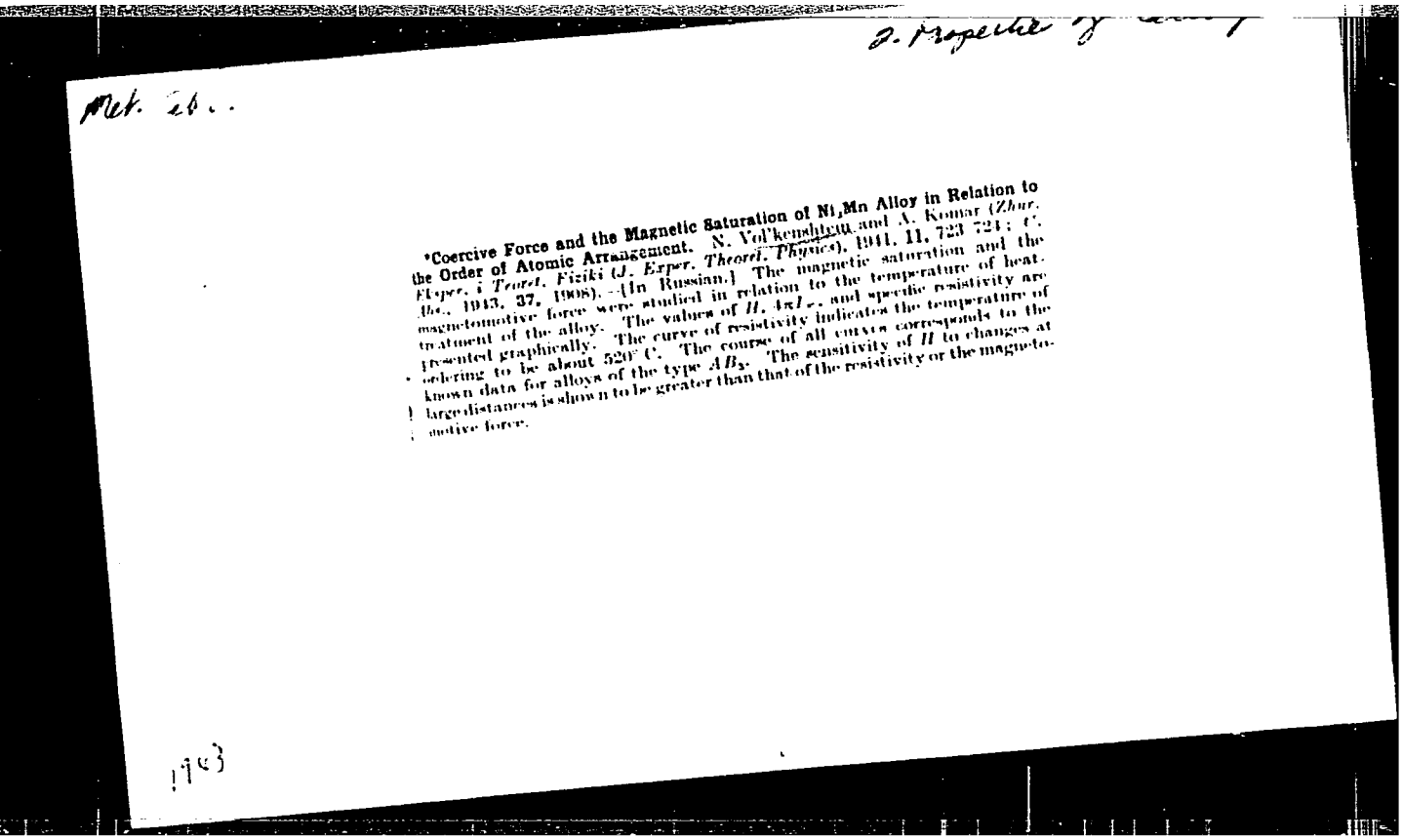
Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 6447

Author : Vol'kenshteyn, M.V.
Title : Progress in Research on High Molecular Compounds (Conference in Leningrad).

Orig Pub : Vestn. AN SSSR, 1956, No 6, 125-127

Abstract : The Eighth Conference on High Molecular Compounds was organized by the Division of Chemical Sciences at the Institute of High Molecular Compounds of the Academy of Sciences, USSR, and was devoted to general problems of chemistry and physics of polymers. Brief abstracts of the 12 papers delivered (of which six are surveys) and of the discussions following the papers are given.

Card : 1/1

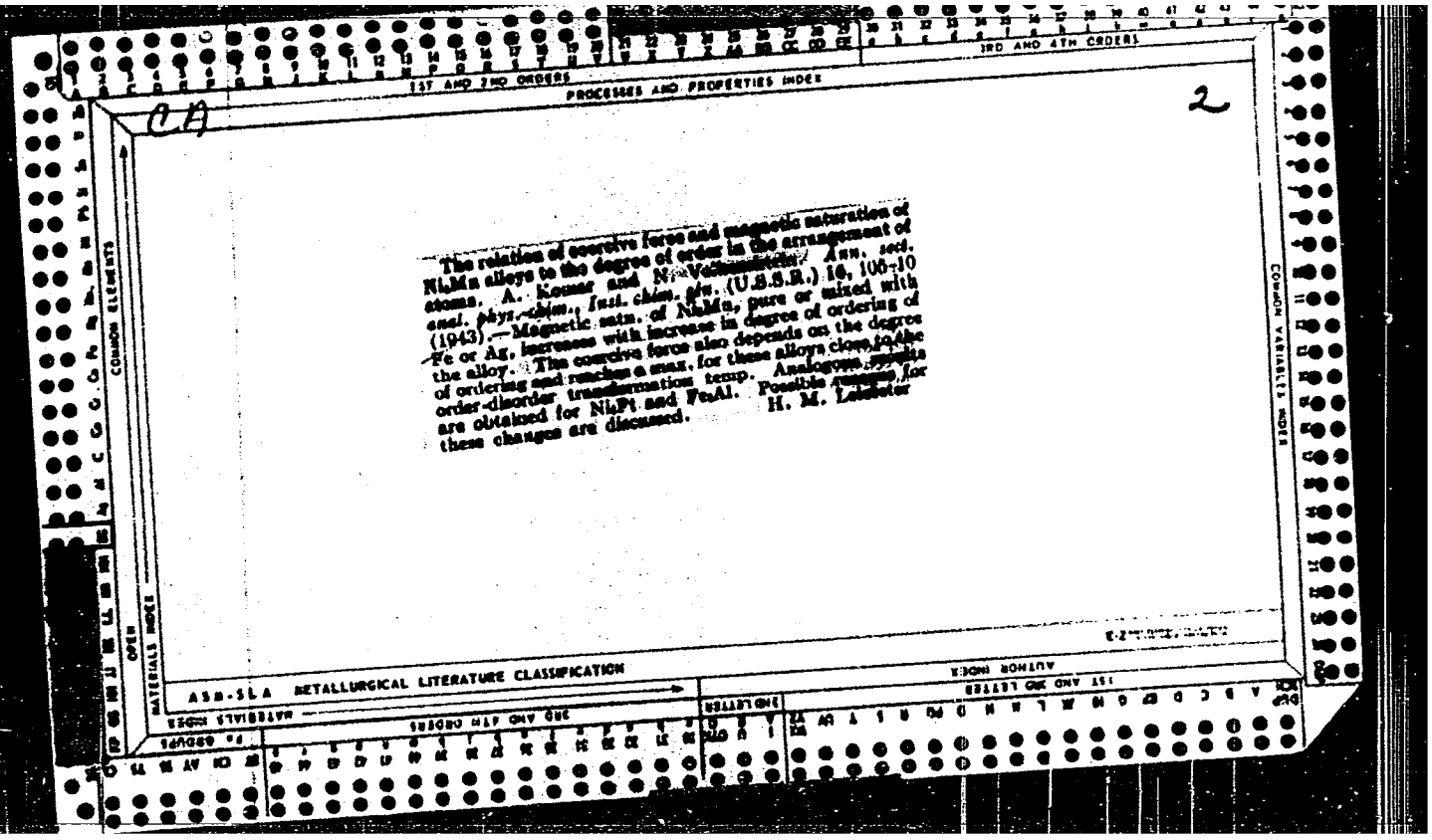


Met. 26..

2. Properties of

*Coercive Force and the Magnetic Saturation of Ni,Mn Alloy in Relation to the Order of Atomic Arrangement. N. Vol'kenshtein and A. Komar (*Zhur. Eksper. i Teoret. Fiziki (J. Exper. Theoret. Physics)*, 1941, 11, 723-724; C. *Abs.*, 1943, 37, 1908). —[In Russian.] The magnetic saturation and the magnetomotive force were studied in relation to the temperature of heat-treatment of the alloy. The values of H_c ($4\pi I_{sat}$) and specific resistivity are presented graphically. The curve of resistivity indicates the temperature of ordering to be about 520° C. The course of all curves corresponds to the known data for alloys of the type AB_3. The sensitivity of H to changes at large distances is shown to be greater than that of the resistivity or the magnetomotive force.

1943



VOLKENSTEYN, N. V.

Study of Electric, Magnetic and Galvanomagnetic Properties of Regularizing Alloys of the Nickel-Manganese System.

Ural State University imeni Gorkiy, Sverdlovsk, 1947.

SO: U-1837, 14 April 52.

ma

"The Dependence of the Hall Constant of Ferromagnetic Metals [Ni_3Mn] on Spontaneous Magnetization. A. Komar and N. Volkenshtein (*Doklady Akad. Nauk S.S.S.R.*, 1948, **60**, (5), 785–786).—[In Russian]. The effect of spontaneous magnetization on the Hall const. R has been studied on alloys with compn. approaching Ni_3Mn, annealed at 250°–600° C. and quenched. The difference ΔR between R_j (corresponding to a given degree of long-range order D and spontaneous magnetization J_{sp}) and R_s (for $D \to 0$ and correspondingly small $J_{s,sp}$) is, at room temp. and at the b.p. of N, equal to the "ferromagnetic" addition $\Delta R = \text{const.}\ (J^2_{sp} - J_s{}^2_{sp})$. An analogous equation can be derived from Kikoin's measurements of R for Ni (*Physikal. Z. Sowjetunion*, 1936, **9**, 1; *M.A.*, **5**, 110; *Zhur. Eksper. Teoret. Fiziki*, 1940, **10**, 1242; *M.A.*, **8**, 321) and can be expected to hold for all ferromagnetics with elect. conductivity at temp. close to the Curie point, depending on spontaneous magnetization. 8 ref.—A. G.

L 36627-65 EWT(m)/T/EWP(t)/EWP(b)/EWA(c) Pu-4 IJP(c) JD/JG
ACCESSION NR: AP5002346 S/0126/64/018/006/0888/0894

AUTHOR: Volkenshteyn, N. V.; Starostina, L. S.; Startsev, V. Ye.; Romanov, Ye. P.

TITLE: Investigation of the temperature dependence of the electrical conductivity of molybdenum and tungsten monocrystals in the low temperature regions

SOURCE: Fizika metallov i metallovedeniye, v. 18, no. 6, 1964, 888-894

TOPIC TAGS: molybdenum, tungsten, monocrystal, polycrystalline molybdenum, polycrystalline tungsten, electrical conductivity, Debye characteristic temperature

ABSTRACT: The temperature dependence of the electrical resistance of high purity molybdenum and tungsten monocrystals and of polycrystalline samples of these metals was measured in the 4.2-300 K temperature range. The crystallographically perfect monocrystals were obtained by zone melting, using electron bombardment heating. The characteristic Debye temperature was calculated for the temperature interval of 10-100 K. The experimental R(T) curves compared favorably with the theoretical Block-Gruneisen and Wilson curves. The effect of

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L 36627-65

ACCESSION NR: AP5002346

4

s--d transitions on the temperature dependence of the electrical resistance of these nonferromagnetic transition metals was discussed. "The authors thank Yu. P. Irkhin for helpful discussion and V. A. Novoselov for assistance in the measurements." Orig. art. has: 3 figures and 6 equations

ASSOCIATION: Institut kristallografii AN SSSR (Institute of Crystallography AN SSSR); Institut fiziki metallov AN SSSR (Institute of the Physics of Metals, AN SSSR)

SUBMITTED: 03Apr64 ENCL: 00 SUB CODE: MM

NR REF SOV: 012 OTHER: 016

Card 2/2

L 38523-65 EWA(h)/EWT(m)/EWP(t)/ETI/EWP(k) Pad IJP(c) JD/JD/HW/JG

S/0181/65/007/002/0543/0545

ACCESSION NR: AP5005299

AUTHOR: Tsiovkin, Yu. N.; Volkenshteyn, N. V.

TITLE: Specific heat of 0.5% solutions of Cr, Mn, Fe, and Ni in platinum

SOURCE: Fizika tverdogo tela, v. 7, no. 2, 1965, 543-545

TOPIC TAGS: chromium, manganese, iron, nickel, platinum, solid solution, specific heat, low temperature behavior, impurity center, state density, localized state

ABSTRACT: To obtain further information on the localized states of an impurity center and on the changes occurring in the conduction band of dilute solutions of transition metals, the authors investigated the temperature dependence of the specific heat of solid solutions of 0.5 at.% Cr, Mn, Fe, and Ni in platinum in the temperature interval 1.6—7K. The measurements were made in a calorimeter, in which the sample was cooled by a contact method. The tests have shown that in the interval 1.6—6K, the specific heat of the solutions of Cr, Mn, and Fe can be satisfactorily described by the formula $C = \gamma T + \alpha T^3 = A/T^2$. Values are presented for the coefficients γ, α, and A. No singularities in the behavior of the specific

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L 38529-65
ACCESSION NR: AP5005299

heat were observed for the solid solution of nickel, which exhibits a behavior similar to that of pure platinum. The large value of the specific heat of the solutions compared with t-at of the solvent and the unusual temperature variation are explained on the basis of the existing notions concerning localized states on the impurity centers, advanced by P. Anderson Phys. Rev. v. 124, 41, 1961).
Orig. art. has: 1 figure.

ASSOCIATION: Institut fiziki metallov AN SSSR, Sverdlovsk (Institute of Physics of Metals, AN SSSR)

SUBMITTED: 05Aug64 ENCL: 00 SUB CODE: SS,TD

NR REF SOV: 002 OTHER: 009

Card 2/2

L 15039-65 EWT(m)/EPF(c)/EWP(t)/EWP(b) Pr-4 AFWL/SSD/AS(mp)-2/ESD(gs)/ESD(t)
JD/JG/MLK
ACCESSION NR: AT4048697 S/0000/64/000/000/0079/0085

AUTHOR: Volkenshteyn, N. V.; Fedorov, G. V.; Galoshina, E. V.; Startsev, V. Ye.

TITLE: Temperature dependence of the electrical and galvanomagnetic properties of rare earth metals 27

SOURCE: Vsesoyuznoye soveshchaniye po splavam redkikh metallov, 1963. Voprosy* teorii i primeneniya redkozemel'ny*kh metallov (Problems in the theory and use of rare-earth metals); materialy* soveshchaniya. Moscow, Izd-vo Nauka, 1964, 79-85

TOPIC TAGS: rare earth metal, rare earth electrical property, rare earth galvanomagnetic property, rare earth magnetic property, Hall effect, rare earth atomic structure

ABSTRACT: The electrical resistance and Hall effect are excellent indicators of the characteristics of the electronic structure of solid bodies. The present paper describes simultaneous measurements of the electrical resistance and the Hall effect for a large group of highly purified rare earth metals. The electrical resistance of neodymium, europium, gadolinium, terbium, dysprosium, holmium, erbium and ytterbium was measured by a common potentiometer in a metal cryostat at temperatures between room and 4.2K. The electrical resistance differed significantly from that of the usual metals with low resistance. The temperature relationships could be used to divide the rare

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earth metals into four groups. The first group contains neodymium and ytterbium, which do not show a linear relationship in the above-mentioned temperature interval. The second group includes dysprosium, holmium and erbium, which show breaks in the curves and low resistance maxima when passing from the paramagnetic into the anti-ferromagnetic condition. The third group contains gadolinium and terbium, which show a sharp break when passing from the paramagnetic to the anti-ferromagnetic condition, with a linear relationship in the paramagnetic field. Europium has a special place among the rare earth metals. It shows a sharp drop in electrical resistance below the point of passage from the paramagnetic into the anti-ferromagnetic condition. The detailed behavior of europium requires further investigation. Analysis of the curves for all the rare metals shows that the specific electrical resistance at equivalent temperatures is higher than for metals in the first group of the periodic table. The Hall effect was measured with a DC potentiometer in a cryostat for europium, holmium, erbium and dysprosium, the authors being the first to measure the Hall effect of europium and holmium. Temperature variations did not change the Hall effect. On the basis of these tests and publications by C. J. Kevan, S. Legvold and G. S. Anderson, it can be seen that all the rare earth metals may be divided into a "light"group (up to gadolinium) and a "heavy" group, in both of which the conductivity depends on the electronic bonding. The paper further describes

L 15039-65
ACCESSION NR: AT4048697

the variations of the Hall effect depending on the temperature, induction and other factors. Scandium should be noted specifically. The 99.86% pure scandium tested contained 0.04% Cu, less than 0.01% Mo, 0.03% Fe, 0.016% N_2, 0.034% O_2, 0.001% H_2 and 0.008% Cd which was distilled under a vacuum. The specific electrical resistance of scandium is very high and exceeds that of copper and calcium. The resistance drops linearly with temperature to the temperature of liquid helium. Paramagnetic susceptibility was also found by the Faraday method. This did not depend on the magnetic field, but rather on the temperature, decreasing as the temperature rose. In conclusion it is noted that the appearance of one electron in the 3d-shell alters the physical properties of scandium in comparison with the other metals. Orig. art. has: 7 figures.

ASSOCIATION: None

SUBMITTED: 13Jun64 ENCL: 00 SUB CODE: MM, EM

NO REF SOV: 002 OTHER: 012

Card 3/3

L 15751-65 EWT(m)/EWP(t)/EWP(b) IJP(c)/ESD(t)/ESD(gs)/SSD/AFWL/AS(mp)-2/
AFETR JD/JG
ACCESSION NR: AP4042806 S/0126/64/018/001/0026/0030

AUTHOR: Volkenshteyn, N. V.; Fedorov, G. V.

TITLE: Temperature dependence of the Hall effect in gadolinium within a 4,2 -370 K temperature range

SOURCE: Fizika metallov i metallovedeniye, v. 18, no. 1, 1964, 26-30

TOPIC TAGS: Gd, Hall effect, temperature dependence, scattering, magnetization, resistivity

ABSTRACT: The authors investigate the temperature dependence in the spontaneous Hall effect which has not been clarified as yet despite numerous papers on the subject. Apparently, two mechanisms of scattering of current carriers determine that dependence: the scattering on phonons and the scattering on spin waves. At low temperatures the scattering on impurities may also be determining. Electrical resistivity , the Hall effect R_s and magnetization M(H, T) of high purity gandolinium ( ) were investigated in 0.2 mm thick specimens after 600 C annealing for 90 minutes and subseq ent furnace cooling. The temperature range was 4,2 - 370 K for all specimens. Exp rimental data are

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L 15751-65
ACCESSION NR: AP4042806

compared with theoretical calculations of the temperature dependence of the spontaneous Hall coefficient. The authors contend that near the Curie point the temperature dependence is determined by the temperature dependence of the magnetic part of electrical resistivity. The authors regret to have been unable to define the values of ρ_p (H, T) and, consequently, the Hall coefficient R_0 with better accuracy, the latter being not temperature-dependent and affected only by the electronic structure of the metal. Estimates showed that the calculated value of R_0 approximates the value of the coefficient above the Curie point. The authors note that based on experimental data it may be concluded that the spontaneous Hall effect is determined by the square of spontaneous magnetization. Orig. art. has: 4 figures and 9 equations.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of the Physics of Metals, AN SSSR)

SUBMITTED: 10Mar64 ENCL: 00

SUB CODE: MM NO REF SOV: 008 OTHER: 008

Card 2/2

VOLKENSHTEYN, N.V.; STARTSEV, V.Ye.

Characteristics of the temperature dependence of the electric resistance of gadolinium and ytterbium at low temperatures. Zhur. eksp. i teor. fiz. 46 no.2:457-459 F '64. (MIRA 17:9)

1. Institut fiziki metallov AN SSSR.

VOL'KENSHTEYN, M. V.; PTITSYN, O. B.

"Stretching of Polymer Chains," Doklady Akad USSR 91: 1313-1316, No 6, 1953. (T-2299).

Evaluation B-83873, 28 Mar 55

VOL'KENSHTEYN, N.V.

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IRML

USSR

Change in electric conductivity of some ferrites by γ-rays. N. V. Vol'kenshtein and A. N. Orlov. *Bull. Acad. Sci. U.S.S.R.*, Ser. Phys. 18, 181-8(1954)(Engl. translation).—See *C.A.* 49, 5113c. H. L. H.

PA

BB

①

USSR/ Physics

Card 1/2 Pub. 43 - 8/11

Authors : Volkenshteyn, N. V., and Orlov, A. N.

Title : Change of the electric conductivity of some ferrites when subjected to γ-rays

Periodical : Izv. AN SSSR ser. fiz. 18/4, 494-501, Jul - Aug 1954

Abstract : A description is given of experiments conducted with the electric conductivity of some ferrites subjected to γ-rays were: the experiments which were conducted from the point of view of the zone theory of semi-conductors for the electric conductivity of a ferrite can be expressed as follows:

$$\sigma = Ae^{-B/T},$$

which is similar to that for semi-conductors (B corresponds to the energy level). The following results were obtained by the experiments: 1) the electric conductivity of some ferrites is noticeably increased after they have been subjected to a γ-ray treatment; 2) the lower the temperature of γ-rays, the higher the maximum of the ferrite electric conductivity will be; 3) the time of relaxation for the electric conductivity at room temperature is of the order of minutes; 4) the zone theory is quite applicable to ferrites in

Card 2/2 Pub. 43 - 8/11 (Additional card)

Izv. AN SSSR ser. fiz. 18/4, 494-501, Jul - Aug 1954

Abstract : explanation of the observed phenomena in ferrites subjected to the γ-rays. The references 1-German; 2-USSR (1947-1951). Diagrams.

Institution : Institute of the Physics of Metals of the Ural Branch of the Acad. of Scs. of the USSR

Submitted : May 3, 1954

Volkenshteyn, N.V.

USSR/Magnetism - Ferromagnetism F-4

Abs Jour : Referat Zhur - Fizika, No 5, 1957, 11997

Author : Volkenshteyn, N.V., Fedorov, G.V.

Inst : Institute of Physics of Metals, Ural' Branch, Academy of Sciences, Sverdlovsk.

Title : Measurement of the Hall-Kikoin Effect.

Orig Pub : Fiz. metallov i metallovedeniye, 1956, 2, No 2, 377-378

Abstract : Description of a new method for measuring the Hall effect in ferromagnets, a method that does not require the preparation of a specimen in the form of a long rod, and consequently, which permits a measurement in an electromagnet. The specimen, made in the form of a thin plate, is compressed between two halves of an ellipsoid, made of the investigated substances, with insulation of mica. The ellipsoid and the specimen are placed in the magnetic

Card 1/2

SOV/56-35-1-11/59

AUTHORS: Volkenshteyn, N. V., Fedorov, G. V., Vonsovskiy, S. V.

TITLE: The Hall Effect of Pure Nickel Within the Range of Helium Temperatures (Effekt Kholla chistogo nikelya v oblasti geliyevykh temperatur)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 1, pp 85 - 88 (USSR)

ABSTRACT: The present paper deals with the investigation of the temperature dependence of R_1 and R_o in the temperature range of between room temperature and 4,2°K; according to reference 1 the following holds for the Hall field: $e = R_o H_2 + R_1 J$ (J = magnetization, R_o ordinary Hall constant), and $R = A\rho^2$ (Ref 6) (A= constant, ρ specific electric resistance). The first data concerning the temperature dependence of Ni within the range of from room temperature to Curie (Kyuri) point were supplied by Kikoin (Ref 2); Jan and Gijsman (Yan, Giysman)(Ref 3) investigated R_o and R_1 for Ni and Fe, and found an unsharp minimum in the ranges of 30-50° (Ni) and 50-70° (Fe). R_1 decreased from $T = 300°K \rightarrow T = 14°K$ to a twentieth part of its value.

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Inst. Physics of Metals Ural Affil AS USSR

The Hall Effect of Pure Nickel Within the Range of Helium Temperatures SOV/56-35-1-11/59

The authors of this paper investigated the Hall effect in pure Ni(99,99%). Size of sample: 9.4.0,3 mm, H = 5000 Oe, B in the sample: 22 000 G; sensitivity of the potentiometer 2.10^{-8}V; measurements were carried out at room temperature, 0°C, as well as in baths of liquid N, liquid H, and liquid He; specific resistances: $\rho_{20,4^\circ}/\rho_{293^\circ} = 12,36.10^{-3}$ and $\rho_{4,2^\circ}/\rho_{293^\circ} = 10,28.10^{-3}$.
The measuring results are given in figures 1-4 in form of diagrams. R_1 decreases sharply with reduced temperature and has a minimum at 20 - 30°K; $R_1(T=300^\circ K) \sim 100.10^{-12}$V.cm/A.G, $R_1(T=14^\circ K) \sim 5.10^{-12}$V.cm/A.G. R_o decreases from 300° to 4,2°K to about 1/3(0,6 → 0,2.10^{-12}V.cm/A.G) and has no minimum. In conclusion the authors (Refs 10-16) discuss the theory of the Hall effect and the possibility of calculating R_1 according to Patrakhin (Ref 15) within the framework of the (s-d) exchange model of ferromagnetism(Vonsovskiy,Ref 16). There are 4 figures and 17 references, 10 of which are Soviet.

Card 2/3

SOV/56-35-5-53/56

24(3), 18(6)
AUTHORS: Vol'kenshteyn, N. V., Turchinskaya, M. I., Galoshina, E. V.

TITLE: On the Particular Features of the Magnetization of Disordered Alloy Ni_3Mn at Low Temperatures (Ob osobennost'yakh namagnicheniya neuporyadochennogo splava Ni_3Mn pri nizkikh temperaturakh)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958, Vol 35, Nr 5, pp 1312-1313 (USSR)

ABSTRACT: It is known that the alloy Ni-Mn near the stoichiometric composition Ni_3Mn belongs to the class of self-ordering alloys with a sharply marked dependence of physical properties on the degree of order in the arrangement of atoms. The occurrence of strong ferromagnetism at the maximum degree of the remote order is particularly noteworthy. Thus, the saturation magnetization I_s of the alloy exceeds that of pure nickel by 50%. According to the experimental results obtained by the authors, the alloy Ni_3Mn becomes ferromagnetic already at the temperature of liquid nitrogen, in which case it holds that I_s = 1350 Oe. The Curie (Kyuri)-temperature Θ was determined from the data obtained by the precise measurement of the temperature

Card 1/3

On the Particular Features of the Magnetization of Disordered Alloy, Ni_3Mn at Low Temperatures

dependence of the electric resistance, and in this way $\Theta = 110^{\circ}K$ was found. An exact investigation of the magnetization curves at various temperatures up to the temperature of liquid helium shows that the character of magnetization has some particular features. Firstly, the curves plotted at 20.4 and 4.2°K after cooling of the sample from room temperature take a course that is much lower than that of the curves plotted in the case of repeated magnetization after previous demagnetization (by commutation from maximum field strength to zero at 20.4 and 4.2°K). This may perhaps be explained by the high energy of magnetic anisotropy. Secondly, the great difference between the magnetization curves plotted at 20.4°K and 4.2°K is remarkable. At field strengths of up to 18,000 Oersted the latter take a course that is much lower than that of the former and do not attain saturation. At 77.8°K coercive force amounts to 140 Oersted, and at 20.4°K it is 1,000 Oersted. Such a great increase indicates a high degree of temperature dependence of the constants of magnetic anisotropy. More accurate conclusions as to the nature of the magnetic properties of

SOV/56-35-5-53/56

On the Particular Features of the Magnetization of Disordered Alloy Ni_3Mn at Low Temperatures

the alloy Ni_3Mn in the disordered state can be drawn only after further accurate measurements will have been carried out. There are 2 figures and 3 references, 1 of which is Soviet.

ASSOCIATION: Institut fiziki metallov Akademii nauk SSSR (Institute for the Physics of Metals of the Academy of Sciences, USSR)

SUBMITTED: August 8, 1958

Card 3/3

SOV/120-59-4-44/50

AUTHORS: Volkenshteyn, N. V. and Turchinskaya, M. I.

TITLE: A Miniature Device for Production of Magnetic Fields of Several Tens of Thousand Oersted

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 4, pp 152-153 (USSR)

ABSTRACT: Magnetic fields of the order of several tens of thousand oersted are frequently required in thermomagnetic and galvanomagnetic studies. To produce such fields in a solenoid very high currents are required and this meets with considerable technical difficulties. It is not always possible to use an electromagnet, especially at low temperatures. Volkenshteyn and Fedorov (Ref 1) suggested a method of measuring the Hall effect in ferromagnetics with the sample clamped between two halves of an ellipsoid of revolution made of a ferromagnetic material. Further development of this method led to a simple device which could be used to measure thermomagnetic and galvanomagnetic effects in a wide range of temperatures, down to liquid-helium temperatures. Fig 1 shows the device in schematic form, with the optimum dimensions for the given cross-section diameter and for the given material of the semi-ellipsoids. It consists of two semi-ellipsoids 1 of Permendur with semi-axes

A Miniature Device for Production of Magnetic Fields of Several Tens of Thousand Oersted

a = 55 mm, b = c = 5 mm, Plexiglass plates 2 of 35 mm dia and 8 mm thickness, and thin brass rods 3 . When the device is placed in a solenoid field of 2000 oersted, a field of 24 000 oersted is produced in the 0.2 mm gap between the semi-ellipsoids. The ellipsoids can have other dimensions different from those in Fig 1, and can be made from Armco iron as well as from Permendur K50F2. Fig 2 shows the dependence of the field in a 0.21 mm gap on the external (solenoid) field for semi-ellipsoids of various dimensions, made of Permendur or of Armco iron. The best material for making these semi-ellipsoids would have high saturation magnetization in low-intensity fields (from this point of view Permendur K50F2 is better than Armco iron). Fig 3 shows the dependence of the field in the semi-ellipsoid gap on the dimensions of the gap in various external fields. It is seen that the gap field falls fairly uniformly with increase of the gap dimensions. For example, when the

SOV/120-59-4-44/50

A Miniature Device for Production of Magnetic Fields of Several Tens of Thousand Oersted

external field is 1550 oersted, the field in a 0.2 mm gap is ~22 000 oersted, and the field in a 1.2 mm gap is only ~17 000 oersted. The device described here can be used to measure simultaneously the Hall effect e.m.f., the resistivity ρ and the change of resistivity in magnetic fields $\Delta\rho/\rho$, which is important at low temperatures. There are 3 figures and 1 Soviet reference.

ASSOCIATION: Institut fiziki metallov AN SSSR (Metal Physics Institute, Academy of Sciences, USSR)

SUBMITTED: May 19, 1958.

Card 3/3

SOV/53-67-4-7/7

21(0)

AUTHOR: Chentsov, R.

TITLE: The Fifth All-Union Conference on the Physics of Low Temperatures (5-ye Vsesoyuznoye soveshchaniye po fizike nizkikh temperatur)

PERIODICAL: Uspekhi fizicheskikh nauk, 1959, Vol 67, Nr 4, pp 743-750 (USSR)

ABSTRACT: This Conference took place from October 27 to November 1 at Tbilisi; it was organized by the Otdeleniye fiziko-matemati-cheskikh nauk Akademii nauk SSSR (Department of Physico-mathematical Sciences of the Academy of Sciences, USSR), the Akademiya nauk Gruzinskoy SSR (Academy of Sciences, Gruzinskaya SSR), and the Tbilisskiy gosudarstvennyy uni-versitet im. Stalina (Tbilisi State University imeni Stalin). The Conference was attended by about 300 specialists from Tbilisi, Moscow, Khar'kov, Kiyev, Leningrad, Sverdlovsk, and other cities as well as by a number of young Chinese scientists at present working in the USSR. About 30 lectures were deliver-ed which were divided according to research fields.

. IV. Magnetism.

A. S. Borovik-Romanov (IFP) delivered a report on investiga-tions he carried out of the anisotropy of the weak ferro-magnetism in monocrystal samples of the antiferromagnetic $MnCO_3$ (the effect of anisotropy was predicted by the thermo-dynamical theory developed by Dzyaloshinskiy). In the course of the discussion R. A. Alikhanov (IFP) spoke about neutrono-graphical investigations he carried out of the magnetic structure of $MnCO_3$ and $FeCO_3$ at low temperatures. P. L. Kapitsa stressed the importance of the method based upon Dzyaloshinskiy's theory. N. M. Kreynes (VNIIFTRI), whose lecture was read by A. S. Borovik-Romanov, reported on measure-ments carried out by him (in the IFP) of the magnetic aniso-tropy of the antiferromagnetic $CuSO_4$- and $CoSO_4$-monocrystals.

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Ye. A. Turov (IFM AN SSSR, Sverdlovsk) spoke about his theore-tical investigations of the magnetizability, the susceptibility, the specific heat, and the resonance frequencies of anti-ferromagnetics and weak ferromagnetics. A. I. Sudovtsov and Ye. Ya. Semenenko (KhFTI) spoke about measurements of the electric resistance of iron in magnetic fields in a wide tem-perature range with simultaneous plotting of the magnetization curve. N. V. Vol'kenshteyn, G. V. Fedorov, E. V. Galoshina and M. I. Turchinskaya (IFM AN SSSR) spoke about measurements of magnetization and the Hall effect of polycrystalline samples, nickel and Ni_3Mn at low temperatures. Ye. I. Kondorskiy, V. Rode, U. Gofman and Chang, Shou-ch'un (MGU) gave a report on susceptibility measurements on nickel and its alloys with copper at low temperatures; T. I. Sanadze (TGU) spoke about the spectrum of the paramagnetic resonance of Tb^{3+} in terbium nitrate at temperatures of liquid hydrogen. M. I. Kaganov and V. M. Tsukernik (KhFTI) dealt with the kinetic phenomena in ferromagnetics at low temperatures and with calculation of relaxation time; A. I. Akhiyezer, V. Bar'yakhtar and S. Peletminskiy (KhFTI) carried out a theoretical investigation of the relaxation of the magnetic moment in ferrodielectrics; Vlasov (IFM AN SSSR) showed that a linearly polarized elastic

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(ultrasonic) wave of a frequency of 10^9 cycles when passing through a ferromagnetic substance in the direction of the magnetic field, is subjected to a turn of the polarization plane of the order of 10^{-3} - 10^{-4} radian/cm oersted. M. I. Kaganov pointed out that in this connection yet another phenomenon may be observed, namely the resonance absorption of ultrasonics if the wavelength is equal to the radius of the Larmor orbit of the electron. . V. Various Questions.

One of the most interesting lect[illegible]

24 (3), 18 (7)

AUTHORS: Komar, A. P., Academician, AS UkrSSR, SOV/20-125-3-17/
Volkenshteyn, N. V., Fedorov, G. V.

TITLE: The Change of the Sign of the Constant of Hall in the Ordering of Atoms in an Alloy (Izmeneniye znaka postoyannoy Kholla pri uporyadochenii atomov v splave)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 3, pp 530-531 (USSR)

ABSTRACT: The authors first mention some previous papers on this subject. The alloy Ni_3Mn is characterized by a dependence of its electric and galvano-magnetic properties on the spontaneous magnetization I_s and on the degree of the long-range order η. This dependence discerns this alloy from pure ferromagnetic metals and also from binary alloys of similar structure and composition. The Hall electromotive force E_H of the alloys Ni_3Mn was investigated for the cases of different heat treatment of the used samples in a wide temperature range down to the temperature of liquid helium. According to these investigations, E_H strongly depends

Inst. Physics of Metals, Ural Affil. AS USSR

The Change of the Sign of the Constant of Hall in the [illegible]
Ordering of Atoms in an Alloy

on the manner of fixing the investigated state of the alloy. Even in the case of fixing the non-ordered state (by cooling from high temperatures), the different rate of cooling exerts a great influence. If the alloy is quickly cooled from 800° to room temperature, the alloy is ferromagnetic at this temperature. The Hall constant of this sample was positive and equal to $R_o = + 0.09.10^{-12}$ v. cm/a. gauss.

In the case of ferromagnetics, v_H (it seems to denote the Hall potential) is calculated according to the formula

$$v_H = \frac{R_o Bi}{d} + \frac{R_s \cdot 4\pi i_s i}{d}$$

and R_s the Hall constant connected with the spontaneous magnetization I_s. R_s has an unusual, non-classical, positive sign. This fact agrees also with the results of [illegible] authors (Ref 7). The Hall electromotive force, which is due to the existence of I_s, was found only at low temperatures.

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The Change of the Sign of the Constant of Hall in the Ordering of Atoms in an Alloy

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A diagram shows the curves for the dependence of R_H on B for a sample of Ni_3Mn of ordered grouping ($\eta \sim 1$) of the atoms. In this case, R_0 is equal to $-0.637 \cdot 10^{-1}$ v.cm/a.gauss. The diagram contains also the similar curves for the sample if the degree of the long-range order is lower than 1. All the curves plotted for such a treatment of the alloy show a noticeable decrease of R_H if B increases. R_H passes through the value zero at the temperatures of liquid nitrogen and liquid helium. In the case of partially ordered states or of a mixture of ordered and non-ordered phases, R_H and v_H may be determined according to the above-mentioned formula. In the way discussed in the present paper, the shape of all the curves shown in the diagram may be qualitatively explained. There are 1 figure and 10 references, 6 of which are Soviet.

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AUTHORS: Volkenshteyn, N.V. and Fedorov, G.V.

TITLE: Temperature Dependence of the Hall Effect of Ni-Mn Alloy

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol 9, Nr 2, pp 187 - 194 (USSR)

ABSTRACT: Measurements of the Hall Effect were made for a nickel-manganese alloy of an approximately stoichiometric composition in the disordered state as well as in the state with degrees of distant ordering, in the temperature range from room temperature down to 4.2 °K. The alloy was produced in a high-vacuum high-frequency furnace from nickel and manganese of 99.99% purity. The ingots were homogenization annealed at 1 000 °C for 6 hours and then cut into rods; the rod from the central part was rolled into strip from which 10 x 4 x 0.32 mm specimens were prepared. The experiments were made on 5 specimens, heat-treated as follows:
1) quenching from 800 °C; 2) quenching from 600 °C;
3) quenching from 800 °C followed by soaking at 480 °C for 10 hours; 4) quenching from 800 °C followed by

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Temperature Dependence of the Hall Effect of Ni_3Mn Alloy

soaking at 480 °C for 10 hours plus soaking for 16 hours at 460 °C and for 28 hours at 400 °C; 5) quenching from 800 °C followed by soaking for 10 hours at 480 °C, for 16 hours at 460 °C, for 28 hours at 400 °C and for 72 hours at 350 °C. The measured results are given in the plots, Figures 1-9. These show that at room temperature specimen 1) behaves as a paramagnetic with a small positive Hall constant R_0, which remains positive right down to the helium temperature (Figure 1). Specimen 2) was found to have properties which are characteristic of ferromagnetics (Figure 2) and a reduction of the temperature to the nitrogen temperature led to a change in sign of the Hall constant which became negative; further reduction in the temperature resulted in an increase in R_0 leading to a change in the sign of the entire effect. Comparison of the plots Figures 1 and 2 indicates that the Hall effect is very sensitive to the method of freezing the disordered state, i.e. to the speed of cooling. It is probable that in the case of slower cooling, even from a temperature above the Kurnakov point, distant order ranges will appear which are ferromagnetic at room temperature. Specimen 3)

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was quenched from a temperature below the Kunakov point and had a certain equilibrium degree of distant order (Figure 3); transition into a partially ordered state brought about a sharp change in the character of the $e_H = f(B)$ curves; the behaviour was a typically ferromagnetic one. An increase in the long-range order (specimens 4 and 5, Figures 4 and 5) resulted in a considerable decrease of the spontaneous Hall constant R_s at room temperature, whilst the ordinary Hall constant changed only little. It can be concluded that appearance of ferromagnetism during the process of ordering brings about a sharp change in the shape of the $e_H = f(B)$ curves. The decrease in the R_s with increasing degree of ordering is apparently due to a sharp drop in the specific electric resistance. In spite of the fact that there is no change in the chemical composition of the alloy, transition from the disordered state to the ordered state seems to change completely the behaviour of the substance (Figures 6 and 7);

Temperature Dependence of the Hall Effect of Ni_3Mn Alloy

whilst in the disorder state (Curve 1) R_0 and R_s decrease with increasing temperature, both these values increase with increasing temperature for all degrees of ordering. The dependencies of R_s and R_0 on the heat-treatment temperature, i.e. on the state of ordering, indicate that the ferromagnetic Hall constant R_s is particularly sensitive to the transition from the disorder to the ordered state and this manifests itself by a sharp maximum at a temperature which approaches the beginning of the ordering temperature. The maximum was observed at all the temperatures and particularly at room temperature, since at this temperature the transition occurs from the paramagnetic state into the strongly ferromagnetic state. The spontaneous Hall constant R_s, as well as the ordinary Hall constant R_0 change strongly as a result of ordering of the Ni_3Mn alloy. The

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temperature dependence of R_0 in ferromagnetics differs greatly from that pertaining to non-ferromagnetics. It was found that the spontaneous Hall constant R_s and the ordinary Hall constant R_0 of the alloy in the disordered state depend strongly on the method of fixing this state. Both constants are interrelated and change as a result of ordering of the alloy. During ordering R_0 changes sign; as regards the temperature dependence it differs from the Hall constant of non-ferromagnetic metals. There are 9 figures, 1 table and 17 references, 2 of which are German, 1 Scandinavian, 5 English and 9 Soviet.

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Metal Physics of the Ac.Sc., USSR)

SUBMITTED: September 29, 1959

Card 5/5

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AUTHORS: Volkenshteyn, N.V. and Tsiovkin, Yu.N.

TITLE: Temperature Dependence of the Specific Heat of the Alloy Ni_3Mn in an Unordered State

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol 9, Nr 2, pp 311 - 312 (USSR)

ABSTRACT: Volkenshteyn et al (Ref 1) and Kouvel et al (Ref 2) have shown that a transition from the paramagnetic state into the ferromagnetic state takes place in the unordered alloy Ni_3Mn at about 120 °K. It is, therefore, of interest to measure the specific heat in this temperature region and to determine the character of the transition. The present authors have measured the specific heat by the method described by Khotkevich and Bagrov (Ref 5). The method is convenient in that it involves the use of specimens in the form of thin wires. In the present study, the specimens were 50 cm long and 0.15 mm in diameter. They were prepared from a large piece of the Ni-Mn alloy, cooled down from 1 000 °C. Measurements were made of the resistance of the specimens as a function of temperature

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Temperature Dependence of the Specific Heat of the Alloy Ni_3Mn in an Unordered State

by heating the specimen in a lead block. The temperature was measured by a copper constantan thermocouple and the resistance by the usual potentiometer method. The specimen was placed in one arm of a Kelvin bridge and a short current pulse (5×10^{-3} sec) was passed through it. The magnitude of the current was chosen so as to ensure the heating of the specimen to the required temperature and the short duration of the pulse ensured that the process was adiabatic. During the heating process an oscillographic record was made of the resistance and the current as functions of time. The amount of heat supplied was determined by graphical integration of the power dissipated in the specimen during a known interval of time. A change in the temperature during this time was determined from the curve of the temperature dependence of the resistance. The results obtained are shown in the figure on p 331, in which Curve A shows the resistance as a

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function of temperature and Curve B shows the specific heat as a function of temperature. Curve B has a discontinuity at about 110 °K and Curve A also shows a change at about that temperature characteristic of a phase transition of the second kind. Extrapolation of the specific heat curve to room temperatures is in good agreement with Thomson's data (Ref 4). It is noted that the pulse method gives a good qualitative picture of the change in the specific heat with temperature even in the case of materials with a low temperature coefficient of resistance. There are 1 figure and 5 references, 3 of which are Soviet and 2 English.
(Note: this is an abridged translation)

ASSOCIATION: Institut fiziki metallov AN SSSR (Institute of Physics of Metals of the Ac.Sc., USSR)

SUBMITTED: September 29, 1959

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E021/E435

18.8100

AUTHORS: Volkenshteyn, N.V. and Tsiovkin, Yu.N.

TITLE: Study of the Kinetic Curves of Electrical Resistance of Ordered Alloys

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol 9, Nr 4, pp 627-630 (USSR)

ABSTRACT: An attempt has been made to investigate the kinetic curve of the electrical resistance by rapid heating by means of an electric current. Samples of nickel-manganese (23.8% Mn) were used. A series of samples were heated at 520°C for three hours, then at 480°C for eight hours and 460°C for fifteen hours. Some of the samples were quenched in water from 460°C and the remainder were heated at 380°C for twenty hours and furnace cooled. The unordered state was obtained by heating a sample with an electric current in a vacuum of 10^{-3} mm mercury to 1000 to 1200°C for 10^{-2} seconds, followed by a quench to room temperature. The electrical resistance during heating was found by the impulse method (Ref 3). A square topped pulse of 10^{-2} sec duration was fed to the specimen which formed one of the arms of a Thomson bridge. The

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Study of the Kinetic Curves of Electrical Resistance of Ordered Alloys

relationship between the electrical resistance and the time of heating is shown in the figure on p 629. Curve 1 applies to the alloy ordered at 380°C and, up to a certain point, this curve is the same as that usually obtained for ferromagnetics. With decrease in ordering (Curve 2 ordered at 460°C), the maximum in the transition region is smoother. The curve for the unordered sample (Curve 3), quenched from 1000 to 1200°C, is quite different from the other two. The impulse method makes it possible to distinguish between the order-disorder transition and the point of ferromagnetic transformation. There are 1 figure and 7 references, 3 of which are Soviet, 2 English, 1 Japanese and 1 German.

ASSOCIATION: Institut fiziki metallov AN SSSR
(Institute of Physics of Metals AS USSR)

SUBMITTED: November 9, 1959

Card 2/2

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S/126/60/010/003/009/009/XX
E032/E314

AUTHORS: Volkenshteyn, N.V. and Galoshina, E.V.

TITLE: The Temperature Dependence of the Residual Electrical Resistivity of Ordered Alloys

PERIODICAL: Fizika metallov i metallovedeniy, 1960, Vol. 10, No. 3, pp. 494 - 495

TEXT: The electrical resistivity of crystalline materials can frequently be used as a sensitive indicator of changes taking place in a solid specimen. This is due to the fact that crystal-lattice imperfections affect the behaviour of conduction electrons, and from this point of view the formation of short-range order should affect the character of the temperature dependence of electrical resistivity. The present authors have investigated the resistivity of Ni_3Mn and Cu_3Pd alloys as a function of the annealing temperature. The specimens were in the form of wires. Potentiometer leads were spot-welded onto them and were made of the same material. The distance between the two points was 1 cm. The specimens

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The Temperature Dependence of the Residual Electrical Resistivity of Ordered Alloys

were heated in evacuated ampules for between one and several hours. The resistivity was measured by the ППТН-1 (PPTN-1) potentiometer at two temperatures, namely, room temperature and liquid-nitrogen temperature. It was found that lower temperatures were not necessary because the resistivity at liquid-nitrogen temperatures is close to the residual resistivity. The resistivities were measured to an accuracy of 0.01%. Figs. 1 and 2 show $\rho_{77.8°K}/\rho_{293°K}$ as functions of the quenching temperature. The presence of a minimum in the resistivity, which is clearly seen in these experimental results, can be explained by the existence of fluctuations in composition and order near the ordering temperature, or the existence of short-range order which in these alloys tends to increase the

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The Temperature Dependence of the Residual Electrical Resistivity of Ordered Alloys

resistivity (Krivoglaz and Rybak - Ref. 8 and Katsnel'son - Ref. 9).
There are 2 figures and 9 references: 6 Soviet and 3 non-Soviet.

ASSOCIATION: Institut fiziki metallov AN SSSR
(Institute of Physics of Metals of the AS USSR)

Card 3/4

VOLKENSHTEYN, N.V.; FEDOROV, G.V.

Temperature dependence of the Hall effect in pure ferromagnetics. Zhur. eksp. i teor. fiz. 38 no.1:64-68 Jan '60. (MIRA 14:9)

1. Institut fiziki metallov Akademii nauk SSSR.
(Hall effect) (Magnetic materials)

VOLKENSHTEYN, N.V.; TURCHINSKAYA, M.I.

Anisotropy of the magnetization intensity of a disordered Ni_3Mn alloy at the temperature of liquid helium. Zhur. eksp. i teor. fiz. 38 no.1:270-271 Jan '60. (MIRA 14:9)

1. Institut fiziki metallov AN SSSR.
(Nickel-manganese alloys--Magnetic properties)
(Materials at low temperatures)

VONSOVSKIY, S.V.; SVIRSKIY, M.S.; VOLKENSHTEYN, N.V.

Direct determination of shear of Fermi surfaces on polarized conduction electrons in ferromagnetic materials. Fiz. met. i metalloved. 12 no.2:285-287 Ag '61. (MIRA 14:9)

1. Institut fiziki metallov AN SSSR.
(Fermi surfaces) (Ferromagnetism)

VOLKENSHTEYN, N.V.; FEDOROV, G.V.

Temperature dependence of electroconductivity and the Hall effect in metallic gadolinium. Izv. AN SSSR. Ser. fiz. 25 no.11:1379-1382 N '61. (MIRA 14:11)

1. Institut fiziki metallov AN SSSR.
(Gadolinium--Electric properties)
(Hall effect)

VOL'KENSHTEYN, N. V., CHICHERNIKOV, V. I., and BELOV, K. P.,

"Magnetic and electric properties of rare-earth metals and their alloys."

report presented at the Conf. on New Trends in the Study and Applications of Rare Earth Metals, Moscow, 18-20 Mar 63

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62

AUTHOR: Volkenshteyn, N. V., Galoshina, E. V., Turchinskaya, M. I., Fedorov, G. V. and Tslovkin, Yu. N.

TITLE: Effect of ordering on electrical magnetic, galvanomagnetic and thermal properties of Ni_3Mn alloy

PERIODICAL: Ukrains'kyy Fizychnyy Zhurnal, v. 8, no. 3, 1963, 306-312.

TEXT: The article investigated the electrical conductivity, magnetization, Hall effect and heat capacity of alloys near the stoichiometric composition Ni_3Mn over a wide range of temperatures down to 1.50 K both in disordered and in states with varying degrees of long-range order. The data which were obtained show that the disordered state and the initial stages of ordering where short range order appears are very complex for Ni_3Mn alloy. The temperature dependence of electrical conductivity was investigated near the Curie point. Magnetization measurements were made on single crystals. The Hall emf for ordered state of this alloy as a function of induction has normal character for ferromagnetic materials. The article contains 7 figures and a 6 item bibliography.

ASSOCIATION: Institut Fiziki metallov AN SSSR (Institute of Metal Physics of the Academy of Sciences of the USSR, Sverdlovsk)

Card 1/1

S/126/63/015/003/019/025
E021/E135

AUTHORS: Volkenshteyn, N.V., and Tsiovkin, Yu.N.

TITLE: Specific heat of alloys of the system Ni - Mn in the temperature range 13 - 300 °K

PERIODICAL: Fizika metallov i metallovedeniye, v.15, no.3, 1963, 465-467

TEXT: The authors briefly report an investigation, using a procedure described elsewhere, of the specific heat of annealed alloys with 25 and 30 atomic % Mn in the disordered state. Both continuous and powdered specimens were used. The results are shown in the figure, where Cp X 10^2 in cal/g degree is shown as a function of absolute temperature by dots and circles for continuous and powder specimens, respectively, of the 25-at.% Mn alloy, and by crosses for 30-at.% Mn powder. The Debye temperature calculated from this curve (Θ_o = 359 °K) agrees well with the theoretical value. The 110 - 120 °K region of the curve shows that the specific volume of anti-ferromagnetic phase is small. There are 1 figure and 1 table.

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Specific heat of alloys of the ... S/126/63/015/003/019/025
E021/E135

ASSOCIATION: Institut fiziki metallov AN SSSR
(Institute of Physics of Metals, AS USSR)

SUBMITTED: July 4, 1962

Card 2/3